

**REMARKS**

Reexamination and reconsideration of the present application are requested.

Claims 7-11, 38-41, and 43-49 remain pending in the application.

**35 U.S.C. § 103**

The Office Action rejected: claims 7, 11, 38, 41, 44 and 47 under 35 U.S.C. § 103 as allegedly being unpatentable over Moore et al. U.S. Patent 5,444,217 (“Moore”) in view of Shinriki et al. U.S. Patent 6,143,081 (“Shinriki”); claims 7, 11, 38, 41, 44 and 47 under 35 U.S.C. § 103 as allegedly being unpatentable over Moore in view of Iida et al. U.S. Patent 5,527,417 (“Iida”); claims 8, 43 and 48 under 35 U.S.C. § 103 as allegedly being unpatentable over Moore in view of Shinriki and Yin et al. U.S. patent 6,189,484 (“Yin”); claims 8, 43 and 48 under 35 U.S.C. § 103 as allegedly being unpatentable over Moore in view of Iida and Yin; claims 9-10 and 49 under 35 U.S.C. § 103 as allegedly being unpatentable over Moore in view of Iida and Shang et al. U.S. Patent 6,189,484 (“Shang”); claims 9-10 and 49 under 35 U.S.C. § 103 as allegedly being unpatentable over Moore in view of Shinriki and Shang; claims 39-40 and 45-46 under 35 U.S.C. § 103 as allegedly being unpatentable over Moore in view of Iida and Collison et al. U.S. Patent 6,203,657 (“Collison”); and claims 39-40 and 45-46 under 35 U.S.C. § 103 as allegedly being unpatentable over Moore in view of Shinriki and Collison.

Applicants respectfully traverse those all of those rejections for at least the following reasons.

**Claims 7, 11, 38, 41, 44 and 47 are Patentable Over Moore in view of Shinriki**

**Claim 7**

Among other things, the apparatus of claim 7 includes a means for annealing a wafer, installed at an upper portion of a processing chamber, and a gas diffuser, installed below the wafer annealing means, for supplying reaction gases into the process chamber.

Applicants respectfully submit that no such apparatus is disclosed or suggested by the combination of Moore and Shinriki.

At the outset, the Office Action fairly admits that Moore fails to disclose the means for annealing a wafer installed at an upper portion of a processing chamber.

However, the Office Action states that Shinriki discloses a heater 280 installed at an upper portion of the processing chamber, and a gas diffuser installed below the heater, and that it would have been obvious to modify Moore to install the “radiant heat source” in the upper portion of the processing chamber because Shinriki shows that this is a suitable position in which to locate a radiant heat source.

Applicants respectfully disagree.

First, moving any sort of additional component into the chamber would be in direct contravention of the teachings of Moore, which specifically teaches that:

*“An important aspect of the invention is that the number of components in reaction chamber 209 has been minimized.”*

Moore at col. 10, lines 49-51. So, Moore teaches away from adding the heat source 204 inside the reaction chamber 209, and it would be contrary to one of the fundamental objects of Moore to modify its device in such a way. Meanwhile, M.P.E.P. § 2141.02 states that: “PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS.” Accordingly, Applicants traverse the proposed modification - or any modification of Moore - which would attempt to move the heat source 204 inside the reaction chamber 209.

Furthermore, the Office Action states that the supposed motivation to modify Moore to install the “radiant heat source” in the upper portion of the processing chamber is that Shinriki shows that this is a suitable position in which to locate a radiant heat source. Applicants respectfully submit that: (1) claim 7 does not specifically call for a “radiant heat source” to be installed at an upper portion of the

processing chamber; and (2) even if, *arguendo*, Shinriki showed that a radiant heat source could be installed in the upper portion of the processing chamber in Moore, this is not proper motivation under 35 U.S.C. § 103 to actually modify Moore to do that

First, claim 7 calls for a **means for annealing a wafer** to be installed in an upper portion of the processing chamber. Meanwhile, the element 280 in Shinriki cited by the Office Action is not a “means for annealing the wafer,” but instead is a UV lamp installed **outside** the process chamber 204 and which merely serves to generate active oxygen atoms from ozone or N<sub>2</sub>O gas (see col. 11, line 66 - col. 12, line 1; col. 12, lines 8-9). Shinriki clearly teaches that the wafer W is heated by the heating resistor 220 buried within the mounting table **beneath** the wafer (see, e.g. col. 13, lines 37-40; col. 14, lines 24-29).

Clearly, element 280 in Shinriki does not and cannot anneal any wafer and, in any event, it is located outside the process chamber. And so, Shinriki absolutely does not show that the upper portion of the processing chamber is a “suitable position” to install a **means for annealing a wafer**, which is what is actually specified in claim 7.

Secondly, even if, *arguendo*, Shinriki showed that a “radiant heat source” (or even a **means for annealing a wafer**) could be installed in the upper portion of the processing chamber in Moore, this is not proper motivation under 35 U.S.C. § 103 to actually modify Moore to do that. M.P.E.P. § 2141.03 states that: the “FACT THAT REFERENCES CAN BE COMBINED OR MODIFIED IS NOT SUFFICIENT TO ESTABLISH PRIMA FACIE OBVIOUSNESS.” Instead, the prior art must also suggest the desirability of the combination.

No such showing is made here.

Finally, the Office Action cites In re Japikse for the proposition that “rearrangement of parts has been held to be obvious.”

However: (1) the apparatus of claim 7 does not involve a “rearrangement of parts” with respect to any cited reference; and (2) “The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims is

not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device," Ex parte Chicago Rawhide Mfg. Co., 223 USPO 351, 353 (Bd. Pat. App.& Inter. 1984).

With regard to point 1, Applicants note that claim 7 includes means for annealing the wafer, installed at an upper portion of the processing chamber; and a gas diffuser installed below the wafer annealing means, for supplying reaction gases into the process chamber. None of the references include a process chamber having such a combination of elements - arranged as claimed, or otherwise.

For example, it appears that Moore does not even disclose a gas diffuser, as in claim 7. Nothing in Moore identifies the "gas injection head 207" as a gas diffuser or mentions that gas injection head 207 diffuses any gas in any way at all! The Office Action completely fails to provide even one sentence of support in Moore for its labeling of gas injection head 207 as a "gas diffuser." Furthermore, Moore's process chamber does not include any means for annealing a wafer. Accordingly, no possible mere "rearrangement" of elements in Moore could produce the apparatus of claim 7.

Moreover, as noted above the prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device. No such motivation or reason has been provided here.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the apparatus of claim 7 is patentable over Moore and Shinriki.

#### Claim 11

Claim 11 depends from claim 7 and is deemed patentable over Moore and Shinriki for at least the reasons set forth above with respect to claim 7.

#### Claim 38

Among other things, the apparatus of claim 38 includes a heater which anneals a wafer, disposed within an upper portion of the processing chamber above the susceptor; and a gas diffuser installed within the processing chamber and adapted

to supply reaction gases into the process chamber.

As explained above: (1) the Office Action fairly admits that Moore fails to disclose a heater which anneals a wafer disposed within an upper portion of the processing chamber; and (2) Applicants respectfully traverse any proposed modification of Moore to add the alleged teaching of Shinriki, as lacking any proper motivation in the prior art.

Furthermore, at this time, Applicants respectfully submit that, in any event, Shinriki does not disclose any heater which anneals a wafer being disposed within an upper portion of the processing chamber above the susceptor. Element 208 is a UV lamp and does not anneal a wafer. Furthermore, element 208 is not disposed within an upper portion of the processing chamber. Instead, the UV lamp 208 is clearly located outside the process chamber, which is why Shinriki teaches that “UV irradiation means 262 (including UV lamps 280) is arranged above the transmission window to emit a UV ray into the process vessel 204.” Shinriki at col. 15, lines 36-38 (parentheticals and emphasis added). So no possible combination of Moore and Shinriki could produce the apparatus of claim 38.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the apparatus of claim 38 is patentable over Moore and Shinriki.

Claim 41

Claim 41 depends from claim 38 and is deemed patentable over Moore and Shinriki for at least the reasons set forth above with respect to claim 38.

Claim 44

Among other things, the apparatus of claim 44 includes a means for annealing a wafer, disposed within an upper portion of the processing chamber above the susceptor; and gas diffusing means for diffusing at least one process gas into the process chamber, installed within the processing chamber.

As explained above with respect to claims 7 and 38: (1) the Office Action fairly admits that Moore fails to disclose a heater which anneals a wafer disposed within an upper portion of the processing chamber; (2) Applicants respectfully

traverse any proposed modification of Moore to add the alleged teaching of Shinriki, as lacking any proper motivation in the prior art; (3) in any event, Shinriki does not disclose any heater which anneals a wafer, being disposed within an upper portion of the processing chamber above the susceptor; and (4) Moore does not disclose a gas diffusing means for diffusing at least one process gas.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the apparatus of claim 44 is patentable over Moore and Shinriki.

Claim 47

Claim 47 depends from claim 44 and is deemed patentable over Moore and Shinriki for at least the reasons set forth above with respect to claim 44.

Claims 7, 11, 38, 41, 44 and 47 are Patentable Over Moore in view of Iida

Claim 7

Among other things, the apparatus of claim 7 includes a means for annealing a wafer, installed at an upper portion of a processing chamber, and a gas diffuser installed below the wafer annealing means, for supplying reaction gases into the process chamber.

-----Applicants respectfully submit that no such apparatus is disclosed or suggested-----  
by the combination of Moore and Iida.

At the outset, neither Moore and Iida discloses a gas diffuser installed below the wafer annealing means, for supplying reaction gases into the process chamber.

For example, it appears that Moore does not even disclose a gas diffuser, as in claim 7. Nothing in Moore identifies the “gas injection head 207” as a gas diffuser or mentions that gas injection head 207 diffuses any gas in any way at all! The Office Action completely fails to provide even one sentence of support in Moore for its labeling of gas injection head 207 as a “gas diffuser.”

Also, Applicants respectfully submit that element 112 in Iida cannot correspond to the recited gas diffuser. Iida clearly teaches that the gas flow control plate 112 distributes a non-reactive purge gas B (e.g., N<sub>2</sub> gas) into the chamber to

prevent attenuation of UV rays (see, e.g., col. 9, lines 11-14, 22-27, 42-45). In direct contrast to any diffusion, Iida teaches that the reaction (source) gas A is supplied from a nozzle 110a to flow directly in parallel across the target substrate (see, e.g., col. 9, lines 45-50).

That is, Iida teaches away from using element 112 to diffuse a reaction gas!

So, it is not possible for any combination of Moore and Iida to produce the apparatus of claim 7 including a gas diffuser installed below the wafer annealing means, for supplying reaction gases into the process chamber.

Moreover, the Office Action fairly admits that Moore fails to disclose the means for annealing a wafer installed at an upper portion of a processing chamber.

However, the Office Action states that Iida discloses a heater 102 installed at an upper portion of the processing chamber, and a gas diffuser 112 installed below the heater, and that it would have been obvious to modify Moore to install the “radiant heat source” in the upper portion of the processing chamber because Iida shows that this is a suitable position in which to locate a radiant heat source.

Applicants respectfully disagree.

First, moving any sort of additional component into the chamber would be in direct contravention of the teachings of Moore which specifically teaches that:

*“An important aspect of the invention is that the number of components in reaction chamber 209 has been minimized.”*

Moore at col. 10, lines 49-51. So, Moore teaches away from adding the heat source 204 inside the reaction chamber 209, and it would be contrary to one of the fundamental objects of Moore to modify its device in such a way. Meanwhile, M.P.E.P. § 2141.02 states that: “PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS.” Accordingly, Applicants traverse the proposed modification - or any modification of Moore - which would attempt to move the heat source 204 inside the

reaction chamber 209.

Furthermore, the Office Action states that the supposed motivation to modify Moore to install the “radiant heat source” in the upper portion of the processing chamber is that Iida shows that this is a suitable position in which to locate a radiant heat source. Applicants respectfully submit that: (1) claim 7 does not specifically call for a “radiant heat source” to be installed at an upper portion of the processing chamber; and (2) even if, *arguendo*, Iida showed that a radiant heat source could be installed in the upper portion of the processing chamber in Moore, this is not proper motivation under 35 U.S.C. § 103 to actually modify Moore to do that

First, claim 7 calls for a **means for annealing a wafer** to be installed in an upper portion of the processing chamber. Meanwhile, the element 102 in Iida cited by the Office Action is not a “means for annealing the wafer” or “a heater which anneals the wafer,” but instead is a UV lamp installed outside the process chamber 105 and which provide light rays for a photo-assisted CVD process (see, e.g., col. 8, line 66 - col.9, line 2). Iida clearly teaches that the target substrate 106 is heated by the heater 107 disposed beneath the wafer (see, e.g. col. 9, lines 4-5 and FIGs. 1 and 3).

Clearly, element 280 in Iida does not and cannot anneal any wafer and, in any event, is located outside the process chamber. And so, Iida absolutely does not show that the upper portion of the processing chamber is a “suitable position” to install a **means for annealing a wafer**, which is what is actually specified in claim 7.

Secondly, even if, *arguendo*, Shinriki showed that a “radiant heat source” (or even a **means for annealing a wafer**) could be installed in the upper portion of the processing chamber in Moore, this is not proper motivation under 35 U.S.C. § 103 to actually modify Moore to do that. M.P.E.P. § 2141.03 states that: the “FACT THAT REFERENCES CAN BE COMBINED OR MODIFIED IS NOT SUFFICIENT TO ESTABLISH PRIMA FACIE OBVIOUSNESS.” Instead, the prior art must also suggest the desirability of the combination.

No such showing is made here.



Finally, the Office Action cites In re Japikse for the proposition that “rearrangement of parts has been held to be obvious.”

However: (1) the apparatus of claim 1 does not involve a “rearrangement of parts” with respect to any cited reference; and (2) “The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant’s specification, to make the necessary changes in the reference device,” Ex parte Chicago Rawhide Mfg. Co., 223 USPO 351, 353 (Bd. Pat. App. & Inter. 1984).

With regard to point 1, Applicants note that claim 7 includes means for annealing the wafer, installed at an upper portion of the processing chamber; and a gas diffuser installed below the wafer annealing means, for supplying reaction gases into the process chamber. None of the references include a process chamber having such a combination of elements - arranged as claimed, or otherwise.

As explained above, nothing in Moore identifies the “gas injection head 207” as a gas diffuser or mentions that gas injection head 207 diffuses any gas in any way at all! Furthermore, Moore’s process chamber does not include any means for annealing a wafer. Accordingly, no possible mere-“rearrangement” of elements in Moore could produce the apparatus of claim 7.

Moreover, as noted above the prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant’s specification, to make the necessary changes in the reference device.” No such motivation or reason has been provided here.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the apparatus of claim 7 is patentable over Moore and Iida.

#### Claim 11

Claim 11 depends from claim 7 and is deemed patentable over Moore and Iida for at least the reasons set forth above with respect to claim 7.

Claim 38

Among other things, the apparatus of claim 38 includes a heater which anneals a wafer, disposed within an upper portion of the processing chamber above the susceptor; and a gas diffuser installed within the processing chamber and adapted to supply reaction gases into the process chamber.

As explained above: (1) neither Moore nor Iida discloses a gas diffuser installed below the wafer annealing means, for supplying reaction gases into the process chamber; (2) the Office Action fairly admits that Moore fails to disclose a heater which anneals a wafer disposed within an upper portion of the processing chamber; and (3) Applicants respectfully traverse any proposed modification of Moore to add the alleged teaching of Iida, as lacking any proper motivation in the prior art.

Furthermore, at this time, Applicants respectfully submit that, in any event, Iida does not disclose any heater which anneals a wafer being disposed within an upper portion of the processing chamber above the susceptor. Element 102 is a UV lamp and does not anneal a wafer. Furthermore, element 102 is not disposed within an upper portion of the processing chamber. Instead, the UV lamp 102 is clearly located outside the process chamber, which is why Iida teaches that “the lamp-house 101 (including UV lamp 102) is arranged above the reaction chamber 105.” Iida at col. 1, lines 15-16 (parentheticals and emphasis added). So no possible combination of Moore and Iida could produce the apparatus of claim 38.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the apparatus of claim 38 is patentable over Moore and Iida.

Claim 41

Claim 41 depends from claim 38 and is deemed patentable over Moore and Iida for at least the reasons set forth above with respect to claim 38.

Claim 44

Among other things, the apparatus of claim 44 includes a means for annealing a wafer, disposed within an upper portion of the processing chamber above

the susceptor; and gas diffusing means for diffusing at least one process gas into the process chamber, installed within the processing chamber.

As explained above with respect to claims 7 and 38: (1) neither Moore and Iida discloses a gas diffusing means for diffusing at least one process gas into the process chamber; (2) the Office Action fairly admits that Moore fails to disclose a heater which anneals a wafer disposed within an upper portion of the processing chamber; (3) Applicants respectfully traverse any proposed modification of Moore to add the alleged teaching of Iida, as lacking any proper motivation in the prior art; and (4) in any event, Iida does not disclose any heater which anneals a wafer being disposed within an upper portion of the processing chamber above the susceptor.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the apparatus of claim 44 is patentable over Moore and Iida.

Claim 47

Claim 47 depends from claim 44 and is deemed patentable over Moore and Iida for at least the reasons set forth above with respect to claim 44.

Claims 8, 43 and 48 are Patentable over Moore in view of Shinriki and Yin

Claim 8 depends from claim 7, claim 43 depends from claim 38, and claim 48 depends from claim 44. Applicants respectfully submit that Yin does not remedy the shortcomings of Moore and Shinriki with respect to claims 7, 38 and 44, as explained above.

Accordingly, claims 8, 43, and 48 are deemed patentable over any combination of Moore, Shinriki, and Yin.

Claims 8, 43 and 48 are Patentable over Moore in view of Iida and Yin

Claim 8 depends from claim 7, claim 43 depends from claim 38, and claim 48 depends from claim 44. Applicants respectfully submit that Yin does not remedy the shortcomings of Moore and Iida with respect to claims 7, 38 and 44, as explained above.

Accordingly, claims 8, 43, and 48 are deemed patentable over any combination of Moore, Iida, and Yin.

Claims 9-10 and 49 are Patentable over Moore in view of Iida and Shang

Claims 9-10 depend from claim 7, and claim 49 depends from claim 44. Applicants respectfully submit that Shang does not remedy the shortcomings of Moore and Iida with respect to claims 7 and 44, as explained above.

Accordingly, claims 9-10 and 49 are deemed patentable over any combination of Moore, Iida, and Shang.

Claims 9-10 and 49 are Patentable over Moore in view of Shinriki and Shang

Claims 9-10 depend from claim 7, and claim 49 depends from claim 44. Applicants respectfully submit that Shang does not remedy the shortcomings of Moore and Shinriki with respect to claims 7 and 44, as explained above.

Accordingly, claims 9-10 and 49 are deemed patentable over any combination of Moore, Shinriki, and Shang.

Claims 39-40 and 45-46 are Patentable over Moore in view of Iida and Collison

Claims 39-40 depend from claim 38, and claims 45-46 depend from claim 44. Applicants respectfully submit that Collison does not remedy the shortcomings of Moore and Iida with respect to claims 38 and 44, as explained above.

Accordingly, claims 39-40 and 45-46 are deemed patentable over any combination of Moore, Iida, and Collison.

Claims 39-40 and 45-46 are Patentable over Moore in view of Shinriki and Collison

Claims 39-40 depend from claim 38, and claims 45-46 depend from claim 44. Applicants respectfully submit that Collison does not remedy the shortcomings of Moore and Shinriki with respect to claims 38 and 44, as explained above.

Accordingly, claims 39-40 and 45-46 are deemed patentable over any combination of Moore, Shinriki, and Collison.

**CONCLUSION**

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 7-11, 38-41, and 43-49, and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Kenneth D. Springer (Reg. No. 39,843) at (703) 715-0870 to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, particularly extension of time fees.

Respectfully submitted,

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By: \_\_\_\_\_

  
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